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ELECTROCARDIOGRAPHIC FEATURES OF RIGHT VENTRICULAR DYSFUNCTION IN PATIENTS WITH RIGHT BUNDLE BRANCH BLOCK

ACC Poster Contributions
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Session Title: ECG/Ambulatory Monitoring - Prognosis in Heart Failure
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Background: The right bundle branch and related Purkinje network may become stretched in the setting of a failing right ventricle (RV) as a result of abnormal RV pressure-volume relationship. This stretch may lead to conduction delay that may be detectable by surface electrocardiogram (ECG). We sought to determine ECG features of right bundle branch block (RBBB) that identify patients with RV dysfunction.

Methods: The Mayo Clinic Arizona echocardiography database was reviewed from 2007 to 2009 to identify patients with a diagnosis of severe RV dysfunction, of which, 34 subjects had coexistent RBBB on ECG. A control population was identified by randomly selecting 34 patients with RBBB with normal RV systolic function. The study compared specific ECG features of RBBB, illustrated in the Figure, from the cohort with normal RV function to the cohort with RV dysfunction.

Results: In precordial lead V1, QRS duration was significantly longer in the RV dysfunction cohort (164±22 ms) compared to the control group (148±12 ms), predominantly due to prolonged R' duration (117±27 ms vs. 87±13 ms, $p < .001$). R wave duration in lead aVR and S wave duration in V6 were also longer in the RV dysfunction group compared to controls. In patients with RBBB, V1 R' duration of 100 ms or greater was found to have a specificity of 82.4% for the presence of underlying RV systolic dysfunction.

Conclusion: R' duration in lead V1 greater than or equal to 100 ms is a specific marker of RV systolic dysfunction in patients with RBBB.